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New Tailless Amphibia from Mexico

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ABSTRACT: The following Mexican species are described as new: LEPTODACTYLIDAE. *Microbatrachylus montanus*, type locality, Mt. Ovando, Chiapas; *Microbatrachylus imitator*, La Esperanza, Chiapas; *Eleutherodactylus macdougalli*, La Gloria, Oaxaca. HYLIDAE. *Centrolenella viridissima*, Agua del Obispo, Guerrero; *Hyla rozellac*, Salto de Agua, Chiapas.

Centrolenella fleishmanni Boettger is reported from Mt. Ovando, Chiapas, the first Mexican record. *Hyla pheota* Cope and *Hyla leucophyllata* (Beireis) are reported from Piedras Negras, Petén, Guatemala, on the Mexican boundary. Most of the forms are figured. A figure is given also of *Eleutherodactylus mexicanus* (Brocchi).

THE specimens described or discussed are from either of two sources: The Hobart M. Smith Collection made for the U. S. National Museum, or the E. H. Taylor-H. M. Smith (EHT-HMS) collection, the property of the author, at the University of Kansas. The drawings are by Hazel R. Watson, and Robert Sudlow of the University of Kansas.

Microbatrachylus montanus sp. nov.

(Plate VI, figs. 2, 2a, 2b, 2c)

Type.—U. S. National Museum No. 115507, ♀, collected at Mount Ovando, Chiapas, 6,000 ft. elevation, April 16, 1940, by Dr. and Mrs. Hobart M. Smith.

Paratypes.—U. S. National Museum Nos. 115701, La Esperanza, Chiapas, 115702, Las Nubes; EHT-HMS No. 27846, Salto de Agua, Chiapas.

Diagnosis.—A rather large member of the genus, snout to vent measurement, 27 mm. Tympanum vertically oval, about four-fifths of the diameter of the eye. Strong fold above tympanum continued some distance on sides; no parotoid gland; a large flat inguinal

gland; tibiotarsal articulation reaching beyond the eye; an outer palmar tubercle; slight diagonal ridges across femora and tibiae. A black anal spot flanked by two yellowish-cream spots; large outer metatarsal tubercle, about two-thirds the size of large inner. Anterior wall of buccal cavity vertical; a slight diagonal ridge behind the choanae, but no vomerine teeth.

Description of the type.—Snout oval, the nostril placed closer to tip of snout than eye, its distance from tip in the distance from eye, about one and one-third times; the length of the head (9.5 mm.) slightly shorter than width of head (10.2 mm.); eye relatively small, its diameter slightly greater than its distance to the nostril; tympanum vertically oval, somewhat overhung by the very heavy, supratympanic fold, and widely separated from the eye; dorsal width of an eyelid contained nearly twice in the interorbital distance; canthus rostralis rather strongly marked, the lores very slightly concave, but broadly sloping.

Tongue a little longer than broad, not notched behind, the posterior third free; choanae nearly lateral, but visible when seen from below; there is a faint diagonal elevation posterior to the choanae, but no trace of vomerine teeth. Skin of the back with very minute corrugations, and a few minute pustules more evident posteriorly; a slight median fold can be traced the entire length; two very indistinct folds are on either side of this, arising from behind orbit; between these and the fold continued back above tympanum are two scarcely discernible ridges, one of them, however, distinct on shoulders. A prominent pustule behind the tympanum. The sides are ridged and pustulate; the ventral disk very smooth, the sides of the disk terminating posteriorly on the femora; chin perfectly smooth; dorsal surface of arms smooth; a small tubercle on the under side of forearm followed by a very slight, curving ridge and some pustules.

First finger shorter than the second; three palmar tubercles, median largest, outer small but distinct, touching the medial; terminal pads slightly enlarged; subarticular tubercles strong; a few supernumerary tubercles on palm. The hind limb short, rather thick, the heels overlapping about one millimeter when folded; surfaces above very rugose, the pustules forming distinct diagonal ridges across femur and tibia (continuous when limb is folded); anal region and about two-thirds of the under surface of the femora covered with large granules; no trace of an inner tarsal fold, but a few indistinct pustules on outer edge.

No trace of digital webs. Toes with very strong subarticular

tubercles; the tip of toes slightly widened; both metatarsal tubercles large, conspicuous, the outer nearly two-thirds the size of inner. Only a single supernumerary tubercle on sole.

Color in alcohol.—Above lavender brown of varying shades, the dorsum lighter than the adjoining lateral areas; side of snout dark lavender, with an indistinct broken line of black spots from snout to eye along the lower edge of canthus, continued along edge of lid, widening into a large spot on the supratympanic fold and region beyond tympanum; it then continues in a broken diagonal line to a point low on the side; a few black spots on lips; inguinal region light, the large, inguinal gland cream-yellow; legs indistinctly barred with dark; posterior surface of femur brownish, with minute cream flecks. A large, broadly triangular, black spot about anus, extending to under side of femora, flanked on each side of the anal region by two large irregular cream areas; two similarly colored cream spots on the heel, which, when limbs are folded, are continuous with those at the sides of anal region. Chin and throat brownish with lighter flecks. Posterior part of abdomen light, almost lacking pigment; darker flecks on the knee; undersurface of foot and tarsus dark.

Measurements in mm.—Snout to vent, 27; length of head, 9.5; width of head, 10.2; arm and hand, 15; leg, 47; tibia, 16.5; foot, 21.

Remarks.—The type is a female, with large ovarian eggs. The ovaries are pigmented.

At least four other forms of the genus occur in Chiapas. These are *Microbatrachylus albolabris*, *M. pygmaeus* and *M. imitator*, the last described in this paper. It may be readily distinguished from the first by the absence of the white labial stripe, from *pygmaeus* by the much greater size, the character of the tubercles and dorsal folds, and by color markings; from *imitator* by larger size, different color and the presence of the outer palmar tubercle.

Four male specimens, taken at somewhat lower elevation, are referred to this species with some hesitation. They may not be completely grown, but the condition of the testes shows them to be adult or nearly so. The tympanum in these is more circular and is proportionally closer to the eye, as is to be expected. The eye is a little larger proportionally. The outer palmar tubercles are not discernible in two of the specimens, scarcely so in the others. However, the characteristic markings about the anus and on the heels, as well as the dorsal folds and general coloration agree with the type. I think it unlikely that two species having such peculiar posterior marking would exist in the same locality.

Microbatrachylus imitator sp. nov.

(Plate VI, figs. 1, 1a, 1b, 1c)

Type.—U. S. National Museum No. 115508, collected at La Esperanza, Chiapas. May 15, 1940, by Dr. and Mrs. Hobart M. Smith.

Paratype.—U. S. National Museum No. 115700, collected at Colonia Hidalgo, 8 Km. N. La Esperanza, May 14, 1940, same collectors.

Diagnosis.—A very diminutive species of the genus, snout to vent length, 14.2 mm.; eye large, snout short, broad; a paratoid gland behind tympanum; fold above tympanum not continued; a more or less distinct dorsolateral fold from orbit to groin; diameter of the tympanum little more than half the diameter of eye; leg brought forward the tibiotarsal articulation reaches half way between eye and nostril; no dorsal fold save a faint trace of one in middle of back; inguinal gland large, flat; terminal digital pads slightly widened; inner metatarsal tubercle twice (or more) as large as outer; sub-articular tubercles relatively small; no vomerine teeth. Dorsal region between dorsolateral folds whitish.

Description of the type.—Snout broadly oval; nostril almost half way between the median tip of snout and corner of eye; the length of the head and width are very nearly equal; the diameter of tympanum is contained in length of eye one and three-fourth times; length of eye about one-sixth shorter than length of snout; maxillary prominent with a shelf or groove above it; canthus rather rounded; a slight tubercle behind and slightly below tympanum.

Tongue broadly oval, not nicked behind, a little longer than broad, free behind for nearly one-third of its length; choanae somewhat lateral, but not vertically placed, visible completely when seen from below; front wall of buccal cavity concave; no trace of vomerine teeth or ridges.

Skin of the back generally smooth, but under the lens shows supratympanic fold, arises anterior to the corner of eye and is somewhat diagonally placed; this terminates at the paratoid; a dorsolateral fold, more or less discontinuous, begins behind the orbit above corner of eye, and terminates above groin; sides with some longitudinal folds or wrinkles and some minute beadlike pustules. The inguinal gland distinct, not especially large; none or scarcely a trace of an axillary gland; chin, throat and breast smooth; abdomen with a distinct disk, broadly triangular, the sides terminating on the femora; skin of disk with minute corrugations on the outer part; surfaces of arm smooth with faint suggestion of tubercles behind wrist; leg above with fem-

ora rather smooth, but well-defined diagonal folds on the tibiae; region about anus and the posteroventral surface of femora with moderately distinct granulation.

First finger shorter than second; fingers slightly flattened with a somewhat sharp dermal edge; two palmar tubercles, the outer wanting; subarticular tubercles rather small; three other rather large tubercles on the palm; toes rather flattened, with more or less sharp dermal edges; the tips of the three middle toes minutely larger than outer toes; inner metatarsal tubercle large, somewhat flattened, with inner edge free (?); outer tubercle distinct, much less than half the size of inner. No tarsal fold, but tarsus with some wrinkling apparently due to preservation; subarticular tubercles relatively small; no supernumerary tubercles.

Color in alcohol.—Entire dorsal surface of body clay white to creamy white with a faint peppering of brownish pigment and a faint spot on occiput; sides of head and body dark but not quite uniform brown, with lighter flecks; legs barred, but the pattern of tibia does not fit that of femur when legs are folded; under surface of the body flesh with a very light peppering of brown; under surface of limb darker than venter; anal region a little darker than the posterior parts of femora.

Measurements in mm.—Snout to vent, 14.2; width of head, 6; length of head, 6; snout to arm, 6.2; arm, 8; leg, 26.2; tibia, 7.6; foot, 11.2.

Remarks.—This very diminutive species shows a superficial resemblance to *Microbatrachylus minimus*. This differs from that form in having no secondary dorsal folds, in having the inner metatarsal tubercle much larger, the outer smaller; and the absence of a conspicuous parotoid gland. I believe, however, that the two forms are related. If this type specimen is an adult, as I presume it to be, the males will probably be found to be much smaller, perhaps the smallest species known in the genus. It is presumed that males will lack vocal sacs, and have a proportionally larger tympanum.

The paratype is a very tiny specimen, rather poorly preserved and discolored. It measures 10 millimeters from snout to vent.

Eleutherodactylus macdougalli sp. nov.

(Plate VII, figs. 1, 1a, 1b, 1c)

Type.—EHT-HMS No. 27482; collected above La Gloria, Oaxaca, north of Niltepec, on an Atlantic exposure at an elevation of about 4,500 ft., Feb. 23-27, 1941, by Thomas MacDougall.

Diagnosis.—The dorsal ridges crossing on the back; the dor-

lateral ridges consisting of two or three indistinct tubercles; tarsal fold elongate, nearly half the length of tarsus; ventral disk without granulation; a white and a dark stripe on under surface of tibia.

Description of type.—Snout rather pointed, with a distinct canthus rostralis; eyes moderately prominent, the width of an eyelid (2.55 mm.) much less than interorbital width (3.4 mm.); greatest diameter of tympanum (3 mm. wide, 3.25 mm. high) about $\frac{4}{5}$ to $\frac{5}{6}$ of eye length (3.8 mm.); distance from eye to nostril (3.3 mm.) a little less than length of eye; length of snout, 4.9 mm.

Tongue subcircular, thick, not or but very slightly nicked behind, attached for four-fifths of its length; vocal sacs apparently wanting, as no openings are visible; choanae somewhat lateral, not hidden when seen from below; vomerine teeth on posterior part of two elongate, raised areas separated from each other by a distance about equal to width of one series, the teeth much posterior to choanae, although the raised areas reach to near their posterior borders.

Skin smooth on head and anterior part of body, minutely granular on the posterior part; a pair of ridges arising near posterior corners of eyelids, cross on the back and terminate at a point above end of ilia; dorsolateral dermal ridges running back from eye are indicated by a few small tubercles; a skin fold from eye passes above the tympanum, and is continued along the side of the body to groin; a faint trace of a median dorsal ridge on body; sides more or less granular, without trace of inguinal or axillary gland. A well-defined disk on venter not reaching the femora; skin of disk transversely wrinkled but not areolate or granulate, the edges forming well-defined folds; two small tubercles behind tympanum and an indistinct branch of the supratympanic fold passing down behind tympanum. Dorsal surface of femora and tibia somewhat rugose, ventral and posterior surface granular in region below anus. Throat and breast smooth.

Tibiotarsal articulation reaches a little beyond tip of snout; when limbs are folded at right angles the heels overlapping 3.5 mm.; toes slender with somewhat widened tips and terminal grooves; sub-articular tubercles strong; inner metatarsal tubercle relatively moderate, less than one-half of the distance between tubercle and end of first toe; a small but distinct outer tubercle; a very narrow inner tarsal fold begins behind tubercle and extends about half the length of the tibia; an outer tarsal fold faintly indicated, extending the length of the tibia; toes with rather sharp lateral edges; a faint trace of webbing between bases of toes. First finger longer than second on left hand (on right hand equal to second, apparently abnor-

mally); outer palmar tubercle partially fused with the medial; sub-articular tubercles large; a few supernumerary tubercles present.

Color.—Light gray dorsally, the snout being of a somewhat darker bronze-gray. A black median spot at the juncture of the ridges; a pair of dark spots on the rump; a black spot on anterior part of upper arm and a broken dark stripe on under side of forearm; side of snout dark; the lip indistinctly black and white spotted; a black spot involves tympanum; transverse bars on limbs almost obsolete; chin, breast and under surface of limbs with brownish pigment; a dark and light line under the tibia; heel and under surface of foot dark; dark spots on knee; a triangular dark area about anus.

Measurements in mm.—Snout to vent, 27; width of head, 12; length of head, 13; axilla to groin, 11; arm, 16; leg, 48; tibia, 16; foot, 18.3.

Remarks.—This species, superficially resembling *Eleutherodactylus rhodopis*, differs in a number of characters. In *rhodopis* the dorsal ridges do not meet and cross; dorsolateral ridges are usually distinct; the ventral disk is more or less granulate; the tarsal fold is reduced to a tubercle.

E. rhodopis is distributed in the lowlands in eastern Mexico from the state San Luis Potosí, through Veracruz, Oaxaca and Chiapas. It has been reported from eastern Central America as far south as Costa Rica. I presume that *E. macDougalli* is a restricted mountain form.

Gadow in his "Through Southern Mexico," tells of finding *E. rhodopis* at 10,000 ft. elevation on Citlaltepétl. I am inclined to question this identification of the frogs he observed there, since all the specimens of *E. rhodopis* examined (more than 100 from numerous localities) have been obtained at relatively low elevations.

The species is named for its discoverer.

Eleutherodactylus mexicanus (Brocchi)

(Plate VIII, figs. 2, 2a, 2b, 2c)

Leuiperus mexicanus Brocchi, Bull. Soc. Philom. Paris, Ser. (7), I, No. 4, p. 484 (Type description; type locality, Mexico).

A series of specimens from Lachiguiri, Oaxaca, collected by Mr. MacDougall have much reduced vomerine teeth and most of the other characters are typical. The type has the vomerine teeth in two minute clusters. The arrangements of the median dorsal folds to form the subcircular figure (shown in Plate VIII, fig. 2) is dim or wanting in other specimens of the series.

CENTROLENELLA Noble

The genus *Centrolenella* comprises a group of species of tiny arboreal frogs, with a range extending from southern Mexico to the northern Andes of South America. Noble has pointed out that this genus has T-shaped terminal phalanges and at the same time the intercalated digital cartilage and seem to combine certain characters of the *Hylidae* and *Leptodactylidae*. The genus *Centrolene* Espada is similar in these respects. These two genera have been variously assigned to the two families. Thus Nieden, *Das Tierreich*, Anura I, pp. 369-370, 434-435, refers *Hylla fleishmanni* [= *Centrolenella fleishmanni*] to the genus *Hylodes* and *Centrolene geckoideum* to the genus *Centrolene* under the family CYSTIGNATHIDAE = LEPTODACTYLIDAE, while certain other species referable to one or another of the two genera are placed in the *Hylidae*. Noble in his "Biology of the Amphibia" (1931) places both genera in the family HYLIDAE.

Dunn (*Occ. Papers Boston Soc. Nat. Hist.*, 5, 1931, p. 398) points out variation in the vomerine teeth in *C. prosoblepon* and *C. pulverata*. Whether this variation is due to age as is true in *Hyla smithi* I cannot say. Individuals of *smithi* are large when they transform and many of the young specimens approaching the adult in size may lack vomerine teeth. I believe that in this species they are invariably present in old adults.

I regard the presence of the humeral hooks in male *Centrolene* a character of sufficient importance to maintain that genus separate from *Centrolenella* which lacks the hooks in both sexes.

Centrolenella fleishmanni Boettger

Hylla fleishmanni Boettger, *Bericht. Senck. Ges.* 1893, p. 251; Günther, *Biologia Centrali-Americana*, Rept. Batr.; Sept., 1901, p. 287, pl. 73, fig. D.

A single specimen of this species was collected by Dr. and Mrs. Hobart M. Smith on Mount Ovando, Chiapas, in 1940. This is the first record of the genus in Mexico. Its presence is not surprising since specimens have been obtained in Petén, Guatemala (Michigan No. 79025). These two specimens agree in having the tibiotarsal articulation reaching several millimeters beyond the snout when brought forward. The iris is silver (golden in life?) with some purple flecks. The dorsal surface is a very light cream or flesh (originally green?) with a fine peppering of reddish purple or violet. There is a cream spot on the upper eyelid.

Centrolenella viridissima sp. nov.

(Plate IX, figs. 2, 2a, 2b)

Type.—EHT-HMS No. 27725 ♂; collected at Agua del Obispo, Guerrero, August 2, 1941, by Edward H. Taylor.

Paratypes.—EHT-HMS Nos. 27719-27724; 27726, 27727. Topotypes.

Diagnosis.—Very small frogs, the known maximum size, 23 mm. in male. Related to *C. fleishmanni*, but with shorter, stouter limbs and shorter, wider digits; tibiotarsal articulation does not or barely reaches tip of snout while in *fleishmanni* it reaches much beyond.

A large vocal sac, the slits within mouth, large; no vomerine teeth; skin above covered with minute, irregular granules; abdomen covered with large granules; pupil horizontal; anal flap very broad; two outer fingers half webbed; none or only a trace of web between first three fingers; toes nearly four-fifths webbed; an elongate inner tarsal fold; tympanum concealed; color on all dorsal surfaces bright leaf green, below transparent flesh.

Description of type.—Outline of head, seen from above, rounded, the eyes not extending beyond outline; head not especially depressed; eyes directed somewhat forward, the anterior corner of eye nearly directly behind and on a slightly higher level than nostril; no canthus rostralis, the snout rounded, the lores sloping rather broadly to the lip without concavity; region about nostrils somewhat elevated, with a slight depression between them; the upper lip extends minutely farther forward than nostril, the line between edge of lip and nostril nearly vertical; tympanum concealed, a slight irregular depression suggesting its position; interorbital distance greater than an eyelid; distance between anterior corners of eyes about one-half distance between the posterior corners; a slight fleshy thickening above tympanic region and above arms; an indistinct folding of skin along the sides of body (may be due to preservation).

Entire dorsal surface of body and exposed dorsal surface of arm and leg covered with minute rugosities or granules of irregular size and shape, scarcely discernible without magnification; abdominal surfaces with large, well-defined granules, which are largest posteriorly; on under surface of thigh the granules are somewhat less distinct, tending to form transverse series, with shallow grooves between; on the medial posterior edges of thighs there are two short thickened glandular folds or protuberances.

Internal nares large, more dorsal than lateral in palate; tongue (normally) subcircular, slightly free behind, slightly emarginate;

basal cartilage of the larynx with (apparently) a free, somewhat triangular edge (visible when mouth is opened widely); the vocal sac large, the slitlike openings at sides of tongue; the skin very amply folded on chin and strongly wrinkled at neck; breast smooth, without folds or granules.

Upper arm very slender; without any trace of a humeral cartilage; forearm thickened; fingers short, broad, the distal dilations very little if any wider than digits themselves; subarticular tubercles moderate, flat, that of outer digit tending to be double; first two fingers somewhat opposed to the other two; an indistinct fleshy ridge under forearm; two outer fingers half webbed; a web remnant between second and third, none or only a mere trace of a web between first and second fingers; leg moderately fleshy, the tibiotarsal articulation not or barely reaching tip of snout; when limbs are folded at right angles, the heels touch; toes about four-fifths webbed, except fourth which has two joints free; a rather large, flat, inner metatarsal tubercle; a small, indistinct outer; an elongate inner tarsal fold, not strongly defined; first finger very slightly longer than second, but the two placed side by side appear to be of the same length; surface of hand and foot with a few granulations other than the tubercles; the median palmar tubercle rounded, the inner flat, elongate, rather indistinct; outer toe a little broader than third, the tips not or but little wider than digits.

Color.—In life bright leaf green; concealed parts of limbs and ventral surfaces transparent flesh; the intestine, visible through the abdominal wall, cream yellow to white. The eyeballs are very black. Preserved in alcohol the specimen became a still lighter green and then a bluish-green, while the surfaces below became paper white. The dorsal surfaces, except on upper arm and thigh, have a fine peppering of pigment which is lavender to reddish purplish in color and scarcely discernible as long as the green color remains. There are some whitish flecks visible on back and on the upper surfaces of forearm and tibia.

Measurements in mm.—Snout to vent, 21.1; head width, 8.8; head length, 7.5; arm, 13; leg, 35.5; tibia, 12; foot, 15.

Remarks.—After specimens have been in preserving fluids some time the green fades, light spots appear and the chromatophores which are of a purplish or lavender color are discernible against the light background. There are usually no chromatophores on the dorsal surface of the limbs. However, in two specimens there are one and three minute chromatophores, respectively, on the upper surface of the thigh.

This species, while related to *Centrolenella fleishmanni*, differs from it in a number of points. Thus in *C. fleishmanni* the heel reaches much beyond the snout; the upper parts are smoother, the head is broader proportionally; the iris of the eye is golden instead of black; the choanae are much larger, and there are no fleshy folds below anus or thigh.

The specimens were collected at night in the midst of fine rain. They were on leaves of trees growing in the gulch that carries away the water of the spring at Agua del Obispo. They were discovered through their call, which is a short whistle. The call is given once and then may be repeated after an interval of one-half to one minute. The call is reminiscent of the call of *Syrrophus* or *Microbatrachylus*, rather than that of any *Hyla* I know.

Specimens were clinging to the wet, shiny, tree leaves and their color blended so perfectly with the leaves that I was able to discern their presence only when they raised the head to call, at which time the vocal sac, being of a light color, was visible. Nine specimens were taken, although many more were heard, for the most part among the higher branches and out of reach of my lantern light.

This particular gully had been visited a number of times previously (twice on rainy nights), but the calls of this species had not been heard nor any specimens found. However, specimens of *Hyla erythromma* had been taken. Three of the *Centrolenella* were found together with a single *Hyla erythromma* in one tree where on a previous visit I had found only the latter species.

The rancho, Agua del Obispo, consists of some three or four houses near a spring. The surrounding hills are covered sparsely with pine forest with little or no undergrowth. The general locality had in the past been found to be exceedingly rich in species and specimens. In 1936, I alone collected some thirty-two species of reptiles and amphibians in one day.

On this last journey (1941) I found that most of the country had been burned over during the previous year, and most of the fallen logs and other debris that offered shelter to the animals had been destroyed. By contrast, in a day's collecting at the same time of year, only seven species were taken.

Hyla rozellae sp. nov.

(Plate IX, figs. 1, 1a, 1b, 1c)

Type.—U. S. National Museum No. 115039. Collected at Salto de Agua, Chiapas, by Dr. and Mrs. Hobart M. Smith.

Paratypes.—U. S. National Museum Nos. 115038, 115040-115051. Topotypes. Same collectors.

Diagnosis.—Eye shorter than snout; tympanum exposed, its diameter less than half length of eye; tibiotarsal articulation half way between eye and nostril; three outer fingers a little more than half webbed; toes nearly fully webbed, the membrane reaching almost to the disk, save on fourth finger, and inner side of second; first finger strongly opposing other three. No vocal sac in male.

Related to *Hyla loquax* and *Hyla rickardsi*, but differing from these by the absence of the axillary web, strongly pigmented posterior femoral region; the diameter of tympanum narrower than its distance from eye (in *loquax* and *rickardsi* width of tympanum much more than distance from eye). The chin is granular, rather than smooth and the vocal sac is absent.

Description of the type.—Head as long as wide, broadly oval; canthus moderately sharp, extending across the elevated region above the nostrils and terminating in a point anterior to nostrils; loreal region concave, then flaring broadly to edge of lip; nostrils nearer eye than tip of snout, but there is very little difference in the distance from middle of nostril to median anterior edge of upper lip, and the distance to eye. Eye large, elevated, directed slightly forward, the lid tending to cover back part of eyeball; the lower eyelid apparently shorter than usual in the genus; width of the upper eyelid contained in interorbital width, one and one-half times; tympanum distinct, nearly circular, the skin covering it minutely granular, separated from the eye by a distance one-fourth greater than its diameter. The supratympanic fold distinct, narrow, overhanging the tympanum slightly; area between the nostrils somewhat concave; tongue subcircular, very slightly nicked behind, attached completely; vomerine teeth on two elevated, transverse ridges between choanae, reaching to anterior level but not to posterior level of choanae, and separated from them by a distance somewhat greater than distance between the ridges. Choanae much larger than the vomerine ridges; groove for mucous gland lies transversely, midway between choanae and anterior part of the palate, the groove tending to curve back in middle and at the ends.

Skin above minutely corrugated but without pustules; ventral surfaces covered with granules, those on chin smaller than those on venter; anal region granular, the anal flap not especially elongate.

Disks on digital tips moderately dilated; first finger strongly opposed to other three; a much enlarged tubercle at base of first finger; other palmar tubercles small, rather indistinct; distal subarticular tubercles large, that of the outer finger divided; palm of hand irregularly granular; web very slight between first two fingers. A well-defined tubercular fold on outer under surface of forearm.

Disks on toes smaller than those on outer fingers, the webs extending almost to the base of the disks on the outer side of the three first toes, and the inner side of the fifth. Inner metatarsal tubercle large, the anterior part elevated; outer tubercle very small, situated anterior to level of the inner tubercle. Web between toes and sole of foot granular. A rather indistinct inner tarsal fold, not reaching the inner metatarsal tubercle.

Color.—Above mottled, vinaceous brown, the pigment reduced on hands and feet. Some cream spotting on the sides, the darker color forming an indistinct reticulation. Front face of femur pigmentless, the posterior face rather heavily pigmented; under surface of tarsus pigmented; jaw lighter than remainder of head with a still lighter lip; ventral surfaces cream.

Measurements in mm.—USNM Nos. 115038, 115039; sex ♂, ♀; snout to vent, 33, 43.5; width of head, 10, 14.5; length of head, 10.6, 14.4; axilla to groin, 16, 24; arm, 19.2, 25.7; leg, 48, 69; tibia, 16, 23; tarsus and foot, 21.2, 29; diameter of tympanum, 1.6, 2; length of eye, 3.8, 4.5.

Remarks.—The remainder of the paratypes are all recently transformed young. In these the tongue is circular and not visibly notched behind. The web on the toes is somewhat less extensive.

The relationship is, I believe, with *Hyla ricardsi* and *Hyla loquax*. The following key will assist in differentiating the forms:

- A. A vocal sac present, with a strong web from arm along the side. Tympanum wider than its distance from eye.
 - B. Posterior femoral region unpigmented, red in color; canthus rostralis wanting, the snout rounded.....*Hyla loquax*.
 - BB. Posterior femoral region pigmented. A distinct canthus present...*Hyla ricardsi*.
- AA. No vocal sac; web scarcely discernible in axilla; tympanum much narrower than its distance from eye.....*Hyla rozellae*.

The species is dedicated to Mrs. Rozella Smith, who assisted in collecting the type series.

Hyla leucophyllata (Beireis)

Rana leucophyllata Beireis, Sehr. Ges. Fr. Berlin, 4, 1783, p. 182, pl. 41, fig. 4 (not seen).
Hyla ebraccata Cope, Proc. Acad. Nat. Sci. Philad., 1874, p. 69 (Nicaragua).

The status of Cope's *Hyla ebraccata* from Nicaragua, described as a color variety of *Hyla leucophyllata*, has never been adequately decided. It has been thrown into synonymy of the latter and there has remained. I do not have available sufficient material from southern localities to determine the matter to my own satisfaction. In consequence I am referring to the older species a series of specimens of a small frog collected by Dr. and Mrs. Hobart M. Smith at Piedras Negras, Petén, Guatemala. As this locality is on the Usumacineta river, which forms a part of the boundary of Mexico, this form must be reckoned as a part of the Mexican fauna.

The series contains the following numbers: USNM Nos. 111148-52; EHT-HMS Nos. 12632-33.

If this species is correctly referred to *Hyla leucophyllata* it represents a considerable northern extension of range of the species.

Hyla phaeota Cope

(Plate VIII, figs. 1, 1a, 1b, 1c)

Hyla phaeota Cope. Proc. Acad. Nat. Sci. Phila. 1862 (1863?) p. 358-359. (Type description; type locality, Turbo, Columbia.)

A series of Hylas collected by Dr. and Mrs. Hobart M. Smith at or near Piedras Negras, Petén, Guatemala are, I believe, the northernmost record for this species. This locality is on the Usumacineta river, which borders the Mexican state of Chiapas. It is reasonable to suppose that the species occurs across the river in Chiapas and should be reckoned a member of the Mexican fauna.

I have not examined the type, but the specimen agrees well with the type description save for three points. The canthus is relatively distinct rather than "rounded"; the tongue is somewhat emarginate posteriorly instead of "entire"; and the third toe has two phalanges of the fourth toe free instead of "nearly three." I doubt that these differences are more than relative and in a measure may be a matter of interpretation.

The reticulation on the sides and on the anterior and posterior sides of the femur is usually very distinct. Doctor Smith's notes give the following data on coloration. No. 111147: "Dorsal ground color dark tan, the darker markings darker brown; a fine cream line down canthus; a rich brown (slightly reddish) band below canthus through eye, expanding posteriorly to cover tympanum and terminat-

ing above axilla; bright green below this on loreal region and below eye; a slightly golden, cream line from above axilla around labial region and snout; another rich brown band below this bordering lip; sides of body coarsely reticulated with dark brown; upper part of light lateral area on body green, lower part (in groin) light blue; anteriorly the lower part of the light lateral area is green, except a little behind axilla, where it is white; concealed surfaces of thighs rich, dark wine color, with profusely scattered, round spots of light blue; a narrow border of green on upper edge of concealed surfaces of thighs on proximal third (nearly half); light marks on anterior surface of thigh and on concealed surfaces of tibia and foot, very light brown or white; under throat dirty brown, with small white spots; belly lighter; under side of hind limbs light wine color."

A second specimen is mentioned which lacks the blue color on sides, the dorsal coloration being brown.

Several of the specimens have a bifurcating mark on the shoulder and a black bar between the eyes as mentioned in the type description.

The life colors have faded and no trace of the blue remains at this time.

PLATE VI

- FIG. 1. *Microbatrachylus imitator* sp. nov. Type. U. S. N. M. No. 17137.
La Esperanza, Chiapas. $\times 2$.
- FIG. 1a. Same. Side of head. $\times 3$.
- FIG. 1b. Same. Under side of hand. $\times 3$.
- FIG. 1c. Same. Under side of foot. $\times 3$.
- FIG. 2. *Microbatrachylus montanus* sp. nov. Type. U. S. N. M. No. 14772.
Mt. Ovando, Chiapas, elev. 6,000 ft. $\times 2$.
- FIG. 2a. Same. Side of head. $\times 3$.
- FIG. 2b. Same. Under side of hand. $\times 3$.
- FIG. 2c. Same. Under side of foot. $\times 3$.

PLATE VI

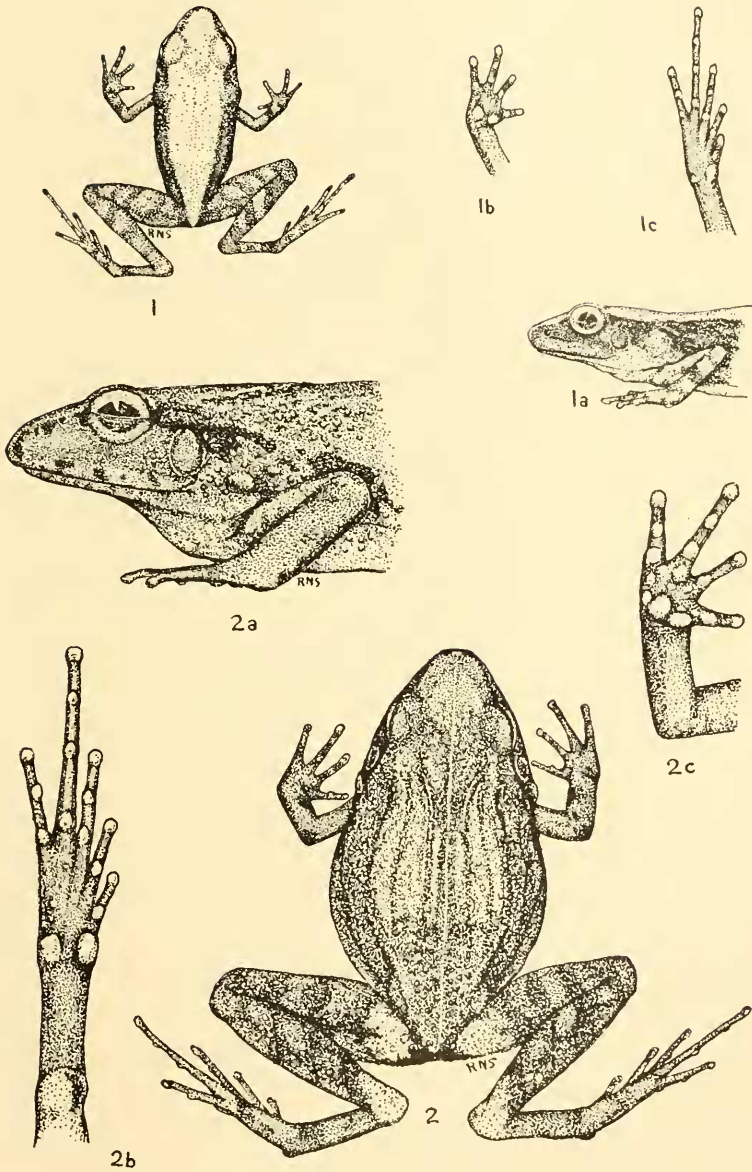


PLATE VII

- FIG. 1. *Elcutherodactylus macdougalli* sp. nov. Type. EHT-HMS No. 27482. La Gloria, Oaxaca, elev. 4,500 ft. $\times 2$.
FIG. 1a. Same. Side of head. $\times 3$.
FIG. 1b. Same. Under side of hand. $\times 3$.
FIG. 1c. Same. Under side of foot. $\times 3$.

PLATE VII

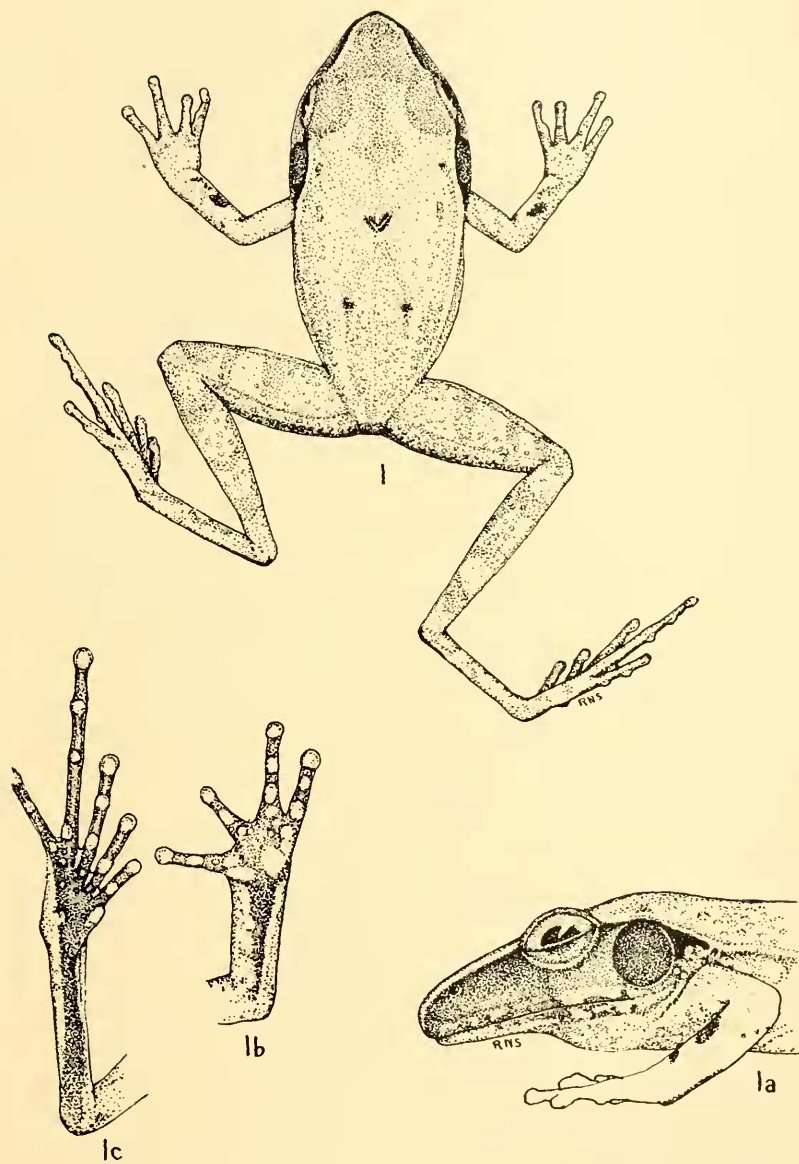


PLATE VIII

FIG. 1. *Hyla phaeota* Cope. EHT-HMS No. 27847. Piedras Negras, Petén, Guatemala. (Actual snout to vent length, 52 mm.)

FIG. 1a. Same. Side of head (enlarged).

FIG. 1b. Same. Under side of hand (enlarged).

FIG. 1c. Same. Under side of foot (enlarged).

FIG. 2. *Eleutherodactylus mexicanus* (Brocchi) U.S.N.M. No. S. 12752. Lachiguiri, Oaxaca. (Actual snout to vent length, 33 mm.)

FIG. 2a. Same. Side of head (enlarged).

FIG. 2b. Same. Under side of hand (enlarged).

FIG. 2c. Same. Under side of foot (enlarged).

PLATE VIII

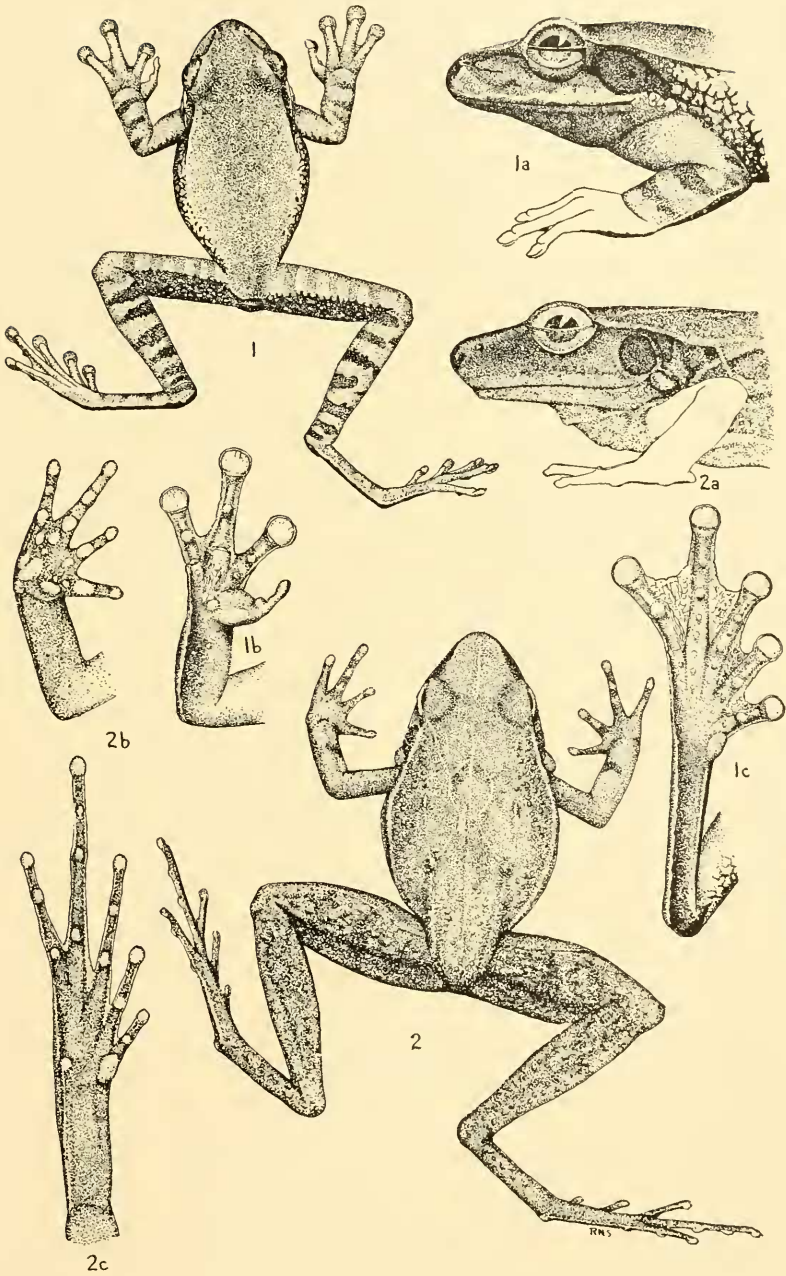


PLATE IX

FIG. 1. *Hyla rozellae* sp. nov. Type. U.S.N.M. No. 115039. Salto de Agua, Chiapas. $\times 1$.

FIG. 1a. Same. Side of head. $\times 2$.

FIG. 1b. Same. Under side of hand. $\times 2$.

FIG. 1c. Same. Under side of foot. $\times 2$.

FIG. 2. *Centrolenella viridissima* sp. nov. Type. EHT-HMS No. 27725. Agua del Obispo, Guerrero. $\times 3$.

FIG. 2a. Same. Under side of hand. $\times 4$.

FIG. 2b. Same. Under side of foot. $\times 4$.

PLATE IX

